

What is Claimed is:

1. A piston pump for dispensing ingredients of cosmetic preparations and that may be easily disassembled for cleaning and sanitization purposes, the piston pump being detachably connected to an outlet port of a cosmetic ingredient package, the piston pump comprising:
  - a valve block comprising an inlet port threadably connected to a nipple which is detachably connected to the outlet port of the cosmetic ingredient package, the valve block further comprising a piston port threadably connected to a cylinder and an outlet port that sealably receives a valve stem, the inlet port, outlet port and piston port being in fluid communication with one another upon removal of the valve stem from the valve block,
    - the valve stem comprising an intake passage and an output passage,
    - the cylinder slidably receiving a piston, the cylinder comprising a distal end threadably connected to the piston port of the valve block and a proximal end, the valve stem being detachably connected to an actuator,
    - the actuator capable of moving the valve stem to an intake position where the valve stem blocks the outlet port of the valve block and the valve block blocks the output passage of the valve stem and intake passage of the valve stem provides communication between the nipple and the piston port thereby permitting flow from the package, through the nipple, through intake passage of the valve stem, through the piston port and into the cylinder upon movement of the piston towards the proximal end of the cylinder,
    - the actuator further being capable of moving the valve stem to a dispense position where the valve stem blocks the inlet port of the valve block and the valve block blocks the intake passage of the valve stem and the output passage of the valve stem is in communication with the cylinder thereby permitting flow from the cylinder, through the output passage of the valve stem and out the valve stem upon movement of the piston towards the distal end of the cylinder.
2. The pump of claim 1 wherein the proximal end of the cylinder is threadably connected to a lock nut, the lock nut preventing the piston from exiting the proximal end of the cylinder.

3. The pump of claim 1 wherein the piston is connected to a distal end of a rod, the rod further comprising a proximal end that is threadably connected to a lock fastener, the lock fastener preventing the proximal end of the rod from entering the cylinder.
- 5
4. The pump of claim 1 wherein the nipple accommodates a check valve that permits flow from the package through the inlet port and not vice versa.
5. The pump of claim 1 wherein the valve block further
- 10 comprising an intake passage and an output passage, the intake and output passages of the valve block being disposed within the piston port,
- in the intake position, the valve stem blocks the output passage of the valve block and the valve block blocks the output passage of the valve stem and the intake passage of the valve stem is in alignment with the intake passage of the valve
- 15 block thereby permitting flow from the package, through the nipple, through intake passages of the valve stem and valve block and into the cylinder upon movement of the piston towards the proximal end of the cylinder,
- in the dispense position, the valve stem blocks the intake passage of the valve block and the valve block blocks the intake passage of the valve stem and
- 20 the output passage of the valve stem is in alignment with the output passage of the valve block thereby permitting flow from the cylinder, through the output passages of the valve block and valve stem and out the valve stem upon movement of the piston towards the distal end of the cylinder.
- 25
6. The pump of claim 1 wherein the valve block is free of check valves.
7. The pump of claim 1 wherein the valve stem is free of check
- valves.
- 30
8. The pump of claim 1 wherein the valve block, valve stem, cylinder and piston are all capable of being sanitized.

9. A piston pump for dispensing ingredients of cosmetic preparations and that may be easy disassembled for cleaning and sanitization purposes, the piston pump being detachably connected to an outlet port of a cosmetic ingredient package, the piston pump comprising:

- 5 a valve block comprising an inlet port threadably connected to a nipple which is detachably connected to the outlet port of the cosmetic ingredient package, the valve block further comprising a piston port threadably connected to a cylinder and an outlet port that sealably receives a valve stem, the valve block further comprising an intake passage and an output passage, the intake and output passages of  
10 the valve block being disposed within the piston port, the inlet port, outlet port, piston port and intake and output passages of the valve block being in fluid communication with one another upon removal of the valve stem from the valve block,
- the valve stem comprising an intake passage and an output passage,  
the cylinder slidably receiving a piston, the cylinder comprising a  
15 distal end threadably connected to the piston port of the valve block and a proximal end, the valve stem being detachably connected to an actuator,
- the actuator capable of moving the valve stem to an intake position where the valve stem blocks the output passage of the valve block and the valve block blocks the output passage of the valve stem and the intake passage of the valve stem is  
20 in alignment with the intake passage of the valve block thereby permitting flow from the package, through the nipple, through intake passages of the valve stem and valve block and into the cylinder upon movement of the piston towards the proximal end of the cylinder,
- the actuator further being capable of moving the valve stem to a  
25 dispense position where the valve stem blocks the intake passage of the valve block and the valve block blocks the intake passage of the valve stem and the output passage of the valve stem is in alignment with the output passage of the valve block thereby permitting flow from the cylinder, through the output passages of the valve block and valve stem and out the valve stem upon movement of the piston towards the  
30 distal end of the cylinder.

10. The pump of claim 9 wherein the proximal end of the cylinder is threadably connected to a lock nut, the lock nut preventing the piston from exiting the proximal end of the cylinder.

11. The pump of claim 9 wherein the piston is connected to a distal end of a rod, the rod further comprising a proximal end that is threadably connected to a lock fastener, the lock fastener preventing the proximal end of the rod from entering the cylinder.

5

12. The pump of claim 9 wherein the nipple accommodates a check valve that permits flow from the package through the inlet port and not vice versa.

13. The pump of claim 9 wherein the valve block is free of check  
10 valves.

14. The pump of claim 9 wherein the valve stem is free of check valves.

15. The pump of claim 9 wherein the valve block, valve stem, cylinder and piston are all capable of being sanitized.

16. A cosmetics ingredient dispensing system comprising;  
a plurality of piston pumps as defined by claim 3 with each pump  
20 being connected to a different ingredient package, each lock fastener being connected to an actuator, and the actuators connected to the lock fasteners and the actuators connected to the valve stems each being linked to a programmable controller, and the pumps all being mounted on a movable table to permit movement of each pump over a container to be filled with ingredients, the table being connected to a drive system  
25 which is linked to the controller, movement of the actuators and table being controlled by the controller.

17. The system of claim 16 wherein each outlet for each package extends through a horizontal flange, each pump being pivotally connected to a lever,  
30 each lever being connected to a vertical rod, wherein downward pressure on one of the rods results in upward pivotal movement of the lever against an underside of the flange to dislodge the outlet of the package from the nipple of its respective pump.

18. A disposable piston pump for pumping material from a package, the pump comprising:

5 a valve block comprising a nipple which is detachable connected to the outlet port of the package, the valve block further comprising a piston port connected to a cylinder and an outlet port, the valve block further comprising a check valve disposed in the nipple permitting flow from the package through the inlet port and not vice versa, the valve block also comprising a check valve disposed in the outlet port permitting flow from the cylinder through the outlet port and not vice versa,  
10 the cylinder slidably receiving a piston, the cylinder comprising a distal end connected to the piston port of the valve block and a proximal end, the valve block being fabricated from injection molded plastic, the cylinder being fabricated from injection molded plastic.

19. The pump of claim 18 wherein the nipple of the valve block is  
15 snap-fitted into the outlet of the package.

20. The pump of claim 18 wherein the cylinder is snap fitted into the piston port of the valve block.